

Little Colorado River Watershed

Watershed Description

This watershed is defined by the Little Colorado River, from its headwaters to the Colorado River, and tributaries to the San Juan River which flow into north and east into New Mexico and Utah. This area contains horizontally stratified sandstone and limestone which have eroded to form canyon and plateaus. In a few areas, igneous rocks have deposited on sedimentary formations due to volcanic activity. Natural erosion can be easily increased by human activities in such locations.

Land ownership is divided approximately as: 60% tribal, 12% federal, 12% private, 6% state. This 26,794 square mile watershed is sparsely populated outside of Flagstaff, with 236,500 people (including Flagstaff) (2000 census). Land use is primarily open grazing, forestry, recreation, and mining. The area contains four national monuments, four wilderness areas, and two national forests with varying levels of use restrictions.

Elevations range from 12,600 feet (above sea level) at Humphrey's Peak near Flagstaff to 2,700 feet near the Colorado River. However, most of the watershed is above 5000 feet elevation, with desert highlands flora and fauna, and coldwater aquatic communities where perennial waters exist.

Water Resources

The climate provides approximately 10 inches of rain and 15 to 20 inches of snow yearly. Snow melt has been a primary source of water for this region. The flow on the Little Colorado River is "interrupted" (stretches of perennial, intermittent, and ephemeral flow). Perennial flow is generally limited to headwaters streams.

An estimate of surface water resources in the Little Colorado Watershed is provided in the following table. Waters on Tribal lands are not assessed by ADEQ; therefore, those statistics are shown separately.

Estimated Surface Water Resources in the Little Colorado Watershed

	Perennial	Intermittent	Ephemeral
Stream miles	640	1,655	9,635
	Perennial	Non-perennial	
Lake acres	16,050	6,830	

On Tribal Lands – Not assessed

	Perennial	Intermittent	Ephemeral
Stream miles	305	170	15,310
	Perennial	Non-perennial	
Lake acres	5,295	118	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.

Little Colorado/San Juan Watershed



Watershed Partnerships

- **Little Colorado River Watershed Coordinating Council**

This council looks at water quality and quantity issues across an immense watershed covering nearly 27,000 square miles that includes parts of New Mexico. They coordinate and encourage efforts by the smaller subwatershed listed below. The council meets in Holbrook or Winslow for quarterly meetings. For information contact: Ronald Smith, Project Director, at (928) 367-335 or rsmith@whitemtns.com; Jim Boles, Chair, 928-298-2422; or Larry Winn, Vice Chair, 505-879-3060.

The following subwatersheds groups are also meeting and working on projects:

- Show Low Creek Group – Tom Thomas at (928) 368-8885, tthomas@ci.pinetop-lakeside.az.us;
- Silver Creek Advisory Commission – Ron Solomon, (928) 536-7366, ron@tayloraz.org; or Kerry Ballard, (928) 536-2539;
- Upper Little Colorado River Partnership (above Lyman Lake) – Bill Greenwood, (928) 333-4128 x226, bgreenwood@eagar.com.

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses – The following TMDL analyses are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL if completed can be obtained at ADEQ's website: www.azdeq.gov

- Nutrioso Creek is impaired by suspended sediment (turbidity).
A TMDL was completed in 2000. Field investigations found that historic grazing and some forestry practices had contributed to a loss of riparian vegetation and stream entrenchment. Healthy riparian areas are needed to stabilize stream banks and dissipate stream energy during high flow events. Stream entrenchment causes a loss of flood plain, which leads to further increased stream velocity and related shear stress during higher flows. The silty-organic clay soils in this area are highly susceptible to water transport. The TMDL identified a variety of management practices to improve cattle grazing and forestry practices. Several of these have been implemented and effectiveness monitoring is ongoing.
- Rainbow Lake is impaired by nutrient loadings, high pH, and low dissolved oxygen.
Excess nutrients can lead to high pH and low dissolved oxygen, algal blooms and even fish kills. A nutrient TMDL was approved in 2000. Nutrient load reductions were assigned to several sources to achieve water quality standards:
 - Septic systems – 75% reduction in nitrogen loading,
 - Runoff (residential, commercial, agricultural, and forests) – 50% reductions in nitrogen and phosphorus loadings
 - Macrophyte (aquatic plant) decomposition – 50% reductions in nitrogen and phosphorus loadingsADEQ is working with landowners and other interested stakeholders to implement strategies identified in the TMDL to achieve water quality standards. Further monitoring is scheduled to determine whether these strategies have been successful.
- The Little Colorado River near Springerville is impaired by suspended sediment (turbidity).
Suspended sediment which causes high turbidity readings represents a risk to aquatic life. A turbidity/suspended sediment TMDL was completed in 2002. The investigation indicated that sediment loadings actually start upstream of these segments. The main cause of the suspended sediments is loss of vegetative cover due to historic grazing practices. Loss of vegetation, especially in the riparian area, allows increased runoff, soil erosion, and bank destabilization. Effective management strategies include increasing riparian vegetation, stream bank stabilization, maintenance of flood plains, and minimization of the impact of cattle in the general area. ADEQ has been working with landowners and other interested stakeholders to implement strategies to reduce sediment transport in the Little Colorado River. Further monitoring to determine the effectiveness of implemented strategies is ongoing.

- The Little Colorado River near Joseph City is impaired due to copper, silver, and suspended sediment concentration (SSC). These pollutants pose a risk to aquatic life and wildlife. Further monitoring is needed to identify sources in this drainage area. TMDLs will be initiated in 2007.
- The Little Colorado River near Woodruff is impaired due to *E. coli* bacteria and suspended sediment. *Escherichia coli* contamination presents a significant public health concern if people are swimming or even wading in the water. A bacteria TMDL will be initiated in 2007. Monitoring for the sediment TMDL will occur in conjunction with monitoring for the other TMDLs on the Little Colorado River.
- Lakes in the Lake Mary region near Flagstaff are impaired by mercury: Upper Lake Mary, Lower Lake Mary, Lower Long Lake, Soldiers Lake, and Soldiers Annex Lake.
Fish consumption advisories have been issued at each of these lakes because consumption of mercury poses risks to humans who eat the fish. Mercury also poses risks to other animals that prey on the fish.

A draft model development report for the Lake Mary region (Malcolm Pirnie, 2006) indicates that mercury is from indirect sources such as: air deposition to the lake and to the watershed (transported to the lakes via runoff), ground water, and natural background. Several remediation scenarios were evaluated using the model: lake aeration, sediment dredging, watershed load reduction, lake level management, and fisheries management. This analysis indicated that reduction of water column concentrations would require reductions in atmospheric loads directly and by reducing soil erosion in the watershed. A draft TMDL should be completed in 2006.

- Lyman Lake (near Springerville) is also impaired by mercury.
A fish consumption advisory has been issued at this lake because consumption of mercury poses risks to humans who eat the fish. Mercury also poses risks to other animals that prey on the fish.
- Bear Canyon Lake is impaired by low pH (alkaline conditions)
Low pH conditions can negatively impact most designated uses (swimming, aquatic life, agriculture). A TMDL is scheduled and will investigate whether sources of this water quality problem.

Water Quality Improvement Grant Projects – ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: <http://www.azdeq.gov/environ/water/watershed/fin.html>.

- **EC Bar Ranch Turbidity Reduction Projects**
EC Bar Ranch (2000, 2001, 2002, 2003, 2004, and 2005)
Restore riparian conditions by exclude cattle from riparian areas and provide alternative water sources for cattle. This should result in stream bank stabilization and reductions in sediment loading to Nutrioso Creek.
- **Rogers Ranch Turbidity Reduction Project**
Rogers Ranch (2000)
Restore riparian vegetation and stream bank stability by excluding cattle from riparian areas and providing alternative water sources along Nutrioso Creek.
- **Big Ditch Water Quality Improvement Project**
The Town of Eager (2000)
Line “Big Ditch”, an irrigation canal, to reduce leakage and improve riparian growth.
- **Murray Basin – Saffel Canyon Phase II Project**
The Apache Sitgreaves National Forest (2001)
Restore stream channels to their natural form and function on two severely degraded tributaries to Nutrioso Creek. Project includes realigning and regrading roads, obliterated some roads, and revegetated some disturbed sites in the Apache Sitgreaves National Forest.
- **Overgaard Townsite Water Protection Project**

The Overgaard Domestic Wastewater Improvement District (2001, 2004)
Connect 20 homes to a 10,000 gallon septic tank and leach field to protect public health and underlying aquifers and nearby streams.

- **Greenwood Sediment Reduction Project**

The Apache Sitgreaves National Forest (2001)

Reconstruct and realign forest roads to reduce sediment contributions to Nutrioso Creek. Erosion stabilization techniques were applied to control active head-cutting and bank erosion caused by roads.

- **Best Management Practices for Wastewater Treatment at Tolani Lake Project**

The Navajo Nation (2001)

Develop a modern wastewater lagoon system and constructed wetland at Tolani Lake. The project was used to teach and promote best management practices associated with the operation and maintenance of wastewater systems, including effluent reuse.

- **Juan Curley Project**

The Navajo Nation (2004)

Develop and implement a grazing management plan for a 270 acre Navajo allotment. The plan is to identify strategies to reduce stream bank and gully erosion.

- **Hell's Hole Spring Development Project**

Apache-Sitgreaves National Forest (2003)

Improve water quality, wetland function, and water capacity at the following springs: Yellow Bull, Upper Linden, Coyote, and Miner.

Water Protection Fund Projects – The following Water Protection Fund Projects have been awarded by the Arizona Department of Water Resources. Information about these funds or projects can be obtained from ADWR at: <http://www.azwater.gov>.

- **Murray Basin – Saffel Canyon Phase II Project**

The Apache-Sitgreaves National Forest (2000)

Restore stream channels to their natural form and function on two severely degraded tributaries to Nutrioso Creek. The Forest Service also realigned and regraded roads, obliterated some roads, and revegetated some disturbed sites.

- **Pueblo Colorado Wash Project**

Hubbell Trading Post Natural Site (2000)

Continue the riparian area restoration of Pueblo Colorado Wash. This project was first funded in 1997 and has been successful in reestablishing the natural sinuosity of the channel, function of the riparian area, and natural vegetative communities in the area.

- **Hubbell Trading Post Riparian Restoration using Treated Effluent Project**

Hubbell Trading Post Natural Site (2000)

In conjunction with the project above, develop a distributions system to use secondary treated effluent to irrigate four acres of flood plain while reestablishing native vegetation in this riparian area.

- **Lake Mary Watershed Streams Restoration Project**

Northern Arizona University (2000)

Reduce sedimentation in tributaries to both Upper and Lower Lake Mary. The project will modify stream channels, revegetate riparian areas, and where possible, relocate roads further from the tributaries.

- **Upper Fairchild Draw Riparian Restoration Project**

Apache Sitgreaves National Forest (2000)

Build an 8-foot high fence to enclose grazing wildlife from a 14 acre wet meadow and plant willows within the enclosure. This work is to reduce detrimental grazing, improve riparian conditions in this headwater to Willow Creek, and therefore, reduce sediment loadings.

- **Round Valley Water Users Project**
Town of Eagar and Round Valley Water Users Association Project (2000)
Study water losses due to current irrigation delivery system and feasibility of a more efficient system. Reductions in water losses are expected to encourage riparian area growth and therefore water quality in the Little Colorado River.
- **Polacca Wash Grazing Management Project**
The Hope Tribe (2000)
Exclude livestock from riparian areas and revegetate using native plants along portions of Polacca Wash.
- **Wet Meadows – A Riparian Restoration Project**
The National Wild Turkey Federation (2003)
Fence off wildlife from five wet meadows in the Apache Sitgreaves National Forest.
- **Wilkins’ Little Colorado River Riparian Enhancement Project**
Ranchers (2003)
In collaboration with Arizona Game and Fish Department, revegetate using native plants, stabilize ¾ mile of stream banks, and create better wildlife habitat along the Little Colorado River near Springerville.
- **Diamond X Ranch Riparian Enhancement Project**
Diamond X Ranch (2004)
Revegetate and improve riparian conditions along the Little Colorado River to reduce sediment loading.
- **EC Bar Ranch Well and Drinker Project**
EC Bar Ranch (2004)
Develop alternative water sources to minimize livestock and wildlife use of a fragile riparian area along Nutrioso Creek.

Other Water Quality Studies

- ***Bathymetric Study of Northern Arizona Lakes – Draft Final Report***
Paul Gremillion and Cristina Piastrini, Northern Arizona University (2005)
Bathymetric maps of the following lakes were created to support the development of Total maximum Daily Loads for mercury and other water quality studies: Ashurst Lake, Kinnikinick Lake, Long Lake, Lower Lake Mary, Upper Lake Mary, Soldier Lake, and Soldier Annex Lake. Along with the maps, tables of surface area and volume versus storage were developed for these seven lakes.
- ***Upper Little Colorado River Concept Plan – A Road Map and Resource Guide to Riparian Enhancement for Private Landowners***
Tom Moody, Ruth Valencia, Kelly Wirtanen, and Mark Wirtanen, Northern Arizona University, College of Engineering and Technology, Dept of Civil and Environmental Engineering (2001)
This report provides information to the riverside landowner for the management of their private lands. It describes fundamental characteristics of a stream and its riparian community and recommends specific practices to reduce bank erosion and channel incision, and improve riparian condition, fishery habitat, livestock watering, and water diversions. The plan also provides information about regulatory permits necessary to conduct projects in and along the riparian corridor and a set of potential funding sources for stream enhancement projects.
- ***Generalized Hydrogeology and Ground Water Budget for the C Aquifer, Little Colorado River Basin and Parts of the Verde and Salt River Basins, Arizona and New Mexico***
Robert J. Hart, John J. Ward, Donald J. Bills, and Marilyn E. Flynn – U.S.G.S.(2002)

This report discusses the hydrogeology, structural controls, aquifers, ground water movement and development, interaction of ground water and surface water, and ground water budget components for the C aquifer. The C aquifer covers more than 27,000 square miles and is the most productive aquifer in the Little Colorado River Watershed. It has a direct hydraulic connection to the Little Colorado River in some places, especially at spring discharges in the lower 13 miles (just above the Colorado River confluence). Ground water pumpage from the C aquifer during 1995 was about 140,000 acre-feet. Discharge from the C aquifer is estimated to be 319,000 acre-feet/year, with downward leakage to limestones accounting for most of the total discharge.

- ***Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2000-2001, and Performance and Sensitivity of the 1988 USGS Numerical Model of the N Aquifer***
 Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2002)
 The N aquifer is the major source of water in the 5,400 square mile Black Mesa area in northeastern Arizona. Since 1971, monitoring has been designed to determine the long term effects of ground water withdrawals from the N aquifer for industrial and municipal uses. During the past 10 years, total withdrawals increased at an average rate of about 3% per year. Water levels in 33 wells dropped an average of 17 feet during the past 35 years (ranging 169-foot drop to 10-foot increase). Long-term effects of pumping on surface waters could not be measured. No significant trend in the annual average discharges for Moenkopi Wash and Laguna Creek, while median winter flows for Dinnebito Wash and Polacca Wash have decreased during the last 6 years.
- ***Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2001-2002***
 Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2002)
 This is a continuation of study above.
- ***Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2001-2002***
 Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2003)
 This is a continuation of study above.
- ***Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2002-2003***
 Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2004)
 This is a continuation of study above.
- ***Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2003-2004***
 Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2005)
 This is a continuation of study above.
- ***Hydrology of the D Aquifer and Movement and Ages of Ground Water Determined from Geochemical and Isotopic Analyses, Black Mesa Area, Northeastern Arizona.***
 Margot Truini and Steve A. Longworth, U.S. Geological Survey, in cooperation with the Bureau of Indian Affairs (2003)
 Water samples from the D aquifer contain higher concentrations of dissolved solids than samples from the N aquifer; therefore, the Navajo Nation and the Hopi Tribe in Black Mesa are concerned about leakage from the overlying D aquifer into the N aquifer which is their primary source of potable water. The study found that leakage is most likely to occur in the southern part of Black Mesa.

- ***Water Quality Data form Navajo National Monument, Northeastern Arizona 2001-2002***
Blakemore E. Thomas – U.S.G.S., in cooperation with the National Park Service (2003)
Water samples were collected from two springs and one well near Betatakin ruin, one spring near Keet Seel Ruin, and one spring and one stream near Inscription House Ruin in 2001 and 2002. Water from all sites is from the N aquifer.
- ***Water Quality Data for Walnut Canyon and Wupatki National Monuments, Arizona 2001-02***
Blakemore E. Thomas, U.S. Geological Survey in cooperation with the National Park Service (2003)
Water quality data were collected from Cherry Canyon seep in Walnut Canyon, the Walnut Canyon headquarters well, Heiser Spring in Wupatki, and from the Little Colorado River at the edge of Wupatki to provide baseline water quality information.

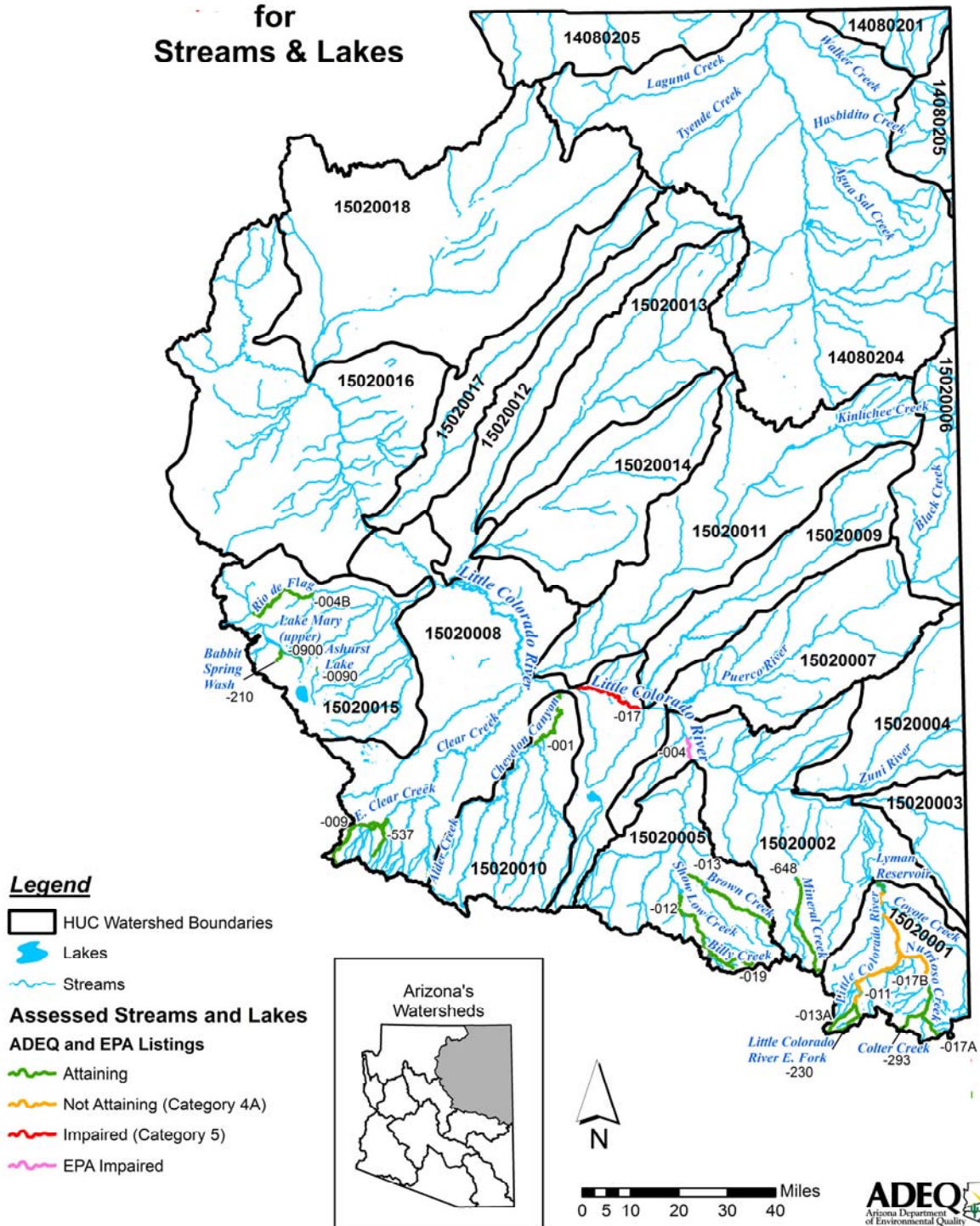
Assessments

The Little Colorado River Watershed can be separated into the following drainage areas (subwatersheds):

14080105	La Plata River Drainage Area (Tribal Land – Not assessed)
14080106	Charco River Drainage Area (Tribal Land – Not assessed)
14080201	Cottonwood Creek Drainage Area (Tribal Land – Not assessed)
14080204	Chinle Wash Drainage Area (Tribal Land – Not assessed)
14080205	Oljeto Wash Drainage Area (Tribal Land – Not assessed)
15020001	Little Colorado River Headwaters Drainage Area
15020002	Upper Little Colorado River Drainage Area
15020003	Carrizo Wash Drainage Area
15020004	Zuni River Drainage Area
15020005	Silver Creek Drainage Area
15020006	Upper Puerco River Drainage Area (Tribal Land – Not assessed)
15020007	Lower Puerco River Drainage Area
15020008	Middle Little Colorado River Drainage Area
15020009	Wide Ruin Wash Drainage Area
15020010	Chevelon Canyon Drainage Area
15020011	Puerco Colorado Wash Drainage Area
15020012	Oraibi Wash Drainage Area (Tribal Land – Not assessed)
15020013	Polacca Wash Drainage Area (Tribal Land – Not assessed)
15020014	Jadito Wash Drainage Area (Tribal Land – Not assessed)
15020015	Canyon Diablo Drainage Area
15020016	Lower Little Colorado River Drainage Area
15020017	Dinnebito Wash Drainage Area (Tribal Land – Not assessed)
15020018	Moenkopi Wash Drainage Area (Tribal Land – Not assessed)

These drainage areas and the surface waters assessed as “attaining” or “impaired” are illustrated on the following watershed map. Methods used to complete these assessments are described in the “Surface Water Assessment Methods and Technical Support” document (2006).

Little Colorado/San Juan Watershed 2006/2008 Assessment for Streams & Lakes



ASHURST LAKE 15020015 -- 0090 200 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Attaining FC – Attaining Agl -- Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/16/2000 – 04/13/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCASH - A 100973	ADEQ Ambient	4-5 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc	5-8 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 7 Fluoride 7 Total dissolved solids 5 Turbidity
Mid Lake LCASH – B 101294	ADEQ Ambient			
Boat Ramp LCASH – BR 101327	ADEQ Ambient (bacteria only)	7 total and 4 dissolved: Mercury		

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	09/09/2004 – 6.1 mg/L	Inconclusive – Low dissolved oxygen in 1 of 7 sampling events (1 of 9 samples) (binomial).

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient dissolved metals (cadmium, copper and zinc) to assess A&Wc.		The lab detection limits for dissolved cadmium, copper, lead, mercury, and silver and total selenium were higher than the chronic A&W criteria for at least one sample.
MONITORING RECOMMENDATIONS		<p>Medium Priority – Collect additional dissolved oxygen due to the exceedance. Note that the old turbidity standard (10 NTU) was exceeded in 5 of 5 samples. Turbidity and low dissolved oxygen may be symptoms of excess nutrient loadings. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.</p> <p>Collect sufficient core parameters to represent at least 3 seasons.</p> <p>Use lower lab detection limits for dissolved metals and selenium.</p>	

BABBIT SPRING WASH From headwaters to Upper Lake Mary 15020015 -- 210 2.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 09/10/2003 – 04/07/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Upper Lake Mary LCBBS000.02 102344	ADEQ TMDL	4 total and 4 dissolved metals: Mercury 2 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc.	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen. 3-4: Dissolved oxygen, pH	4 Fluoride 3 Total dissolved solids 3 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury (dissolved)	0.01 µg/L A&Wc chronic	09/10/2003 – 0.013 µg/L	Inconclusive – Only 1 exceedance during the assessment period.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Insufficient dissolved metals (cadmium, copper, and zinc) and <i>E. coli</i> bacteria samples to assess A&W and FBC.	Insufficient sampling events	Lab detection limits for dissolved cadmium, copper, lead, and silver were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Mercury Priority –Collect mercury samples due to the exceedance. Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for dissolved metals.	

BARBERSHOP CANYON CREEK From headwaters to East Clear Creek 15020008 - 537 10.2 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 12/20/2000 – 07/31/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Merritt Draw LCBRB006.74 100410	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese, and selenium	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/26/2001 – 6.5 mg/L 07/31/2001 – 6.6 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling. Flow 0.01 cfs. Low nutrients (nitrogen 0.1-0.3 mg/L, phosphorus 0.01 mg/L)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab detection limits for selenium and dissolved mercury.	

BEAR CANYON LAKE 15020008 -- 0130 55 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining AgI – Attaining AgL – Inconclusive	Category 2 Attaining some uses		
	E P A	A&Wc – Impaired FBC – Impaired AgL – Impaired	Category 5 Impaired	Low pH	EPA listed due to low pH in 2004.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006/2008 impaired waters list. Such listings do not satisfy requirements established in ADEQ's Impaired Water Identification Rule; therefore, they are not included in the list of ADEQ's Impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/20/2000 – 06/19/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam LCBCL - A 100969	ADEQ Ambient	3-5 total and 0-1 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	4-6 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity
At boat ramp LCBCL – BR 101326	ADEQ Ambient			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	10/18/2000 – 6.6 mg/L	Inconclusive – 1 in 4 samples below criterion. (Binomial)
pH	6.5-9.0 SU A&Wc, FBC, AgL	10/18/2000 – 5.8 SU 05/16/2001 – 6.2 SU 06/13/2001 – 6.3 SU 09/18/2001 – 5.9 SU	Inconclusive – Low pH recorded near the bottom of the lake on each of 4 visits. All low pH values occurred at between 7 to 11.8 meters deep.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Missing dissolved metals (copper, cadmium, and zinc) to assess A&Wc.		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, and selenium) and total selenium were higher than applicable criteria.
DISCUSSION OF LOW PH		Evidence of potential impairment by low pH: <ol style="list-style-type: none"> No data since the last assessment, and All low pH values occurred between 7 to 12 meters deep, which may be due to natural conditions near the lake bottom. 	
MONITORING RECOMMENDATIONS		High Priority – Collect pH measurements to support TMDL development. Collect additional dissolved oxygen samples due to the exceedances. Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals and selenium.	

BILLY CREEK From headwaters to Show Low Creek 15020005 -- 019 18.5 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Inconclusive FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/06/2000 – 09/11/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Pinetop, AZ LCBIL005.75 100946	ADEQ Ambient	8 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, chromium, mercury nickel, silver, thallium, and zinc	8 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	8 <i>E. coli</i> bacteria 8 Fluoride 8 Total dissolved solids 8 Turbidity
Above Porter Creek LCBIL000.01 100947	ADEQ Ambient	8 total metals only: Cadmium, copper, lead, selenium, and silver (4 samples at each of 2 sites)		

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/26/2001 – 5.8 (both sites)	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling.
<i>E. coli</i> bacteria	235 CFU/100 ml FBC	11/06/2000 – 420 CFU/100 ml	Inconclusive – Only 1 exceedance in the last 3 years of monitoring (4 events)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
<i>E. coli</i> bacteria	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional <i>E. coli</i> bacteria samples due to the exceedance. Use lower lab detection limits for selenium and dissolved mercury.	

BLACK CANYON LAKE 15020010 -- 0180 35 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Attaining FC – Attaining DWS – Inconclusive Agl – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/04/2002 – 11/02/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam LCBLC - A 100014	AGFD Ambient	1-2 total metals only: Arsenic, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc	7-8 samples total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 Fluoride 8 Total dissolved solids 6 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	10/04/2002 – 3.3 mg/L 11/13/2002 – 6.1 mg/L 10/20/2003 – 5.7 mg/L	Inconclusive – 3 in 8 samples below criterion. (Binomial)

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient samples to assess any designated use.		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury) and selenium were higher than applicable criteria.
MONITORING RECOMMENDATIONS		<p>Medium Priority – Collect additional dissolved oxygen samples due to the exceedances. Note that the old turbidity criterion (10 NTU) was exceeded in 3 of 6 samples. Turbidity and low dissolved oxygen may be symptoms of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.</p> <p>Collect sufficient core parameters to represent at least 3 seasons.</p> <p>Use lower lab detection limits for dissolved metals and selenium</p>	

BLUE RIDGE RESERVOIR 15020008 -- 0200 290 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining Agl – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/17/2000 – 07/13/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam LCBRR - A 100974	ADEQ Ambient	4-5 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	4-5 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 5 Fluoride 4 Total dissolved solids 4 Turbidity
North inlet LCBRR– C 101293	ADEQ Ambient			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient dissolved metals (copper, cadmium, and zinc) and <i>E. coli</i> bacteria to assess A&Wc and FBC.		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, and silver) were higher than applicable criteria.
MONITORING RECOMMENDATIONS		Low Priority –Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals.	

BROWN CREEK From headwaters to Silver Creek 15020005-016 14.5 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/20/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Brown Spring (Below cattle enclosure) LCBRO018.96 101242	ADEQ Special investigation	2 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc	2 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 2 Fluoride 2 Total dissolved solids 2 Turbidity
Outside cattle enclosure LCBRO018.13 101241	ADEQ Special investigation	2 total metals only: Boron, manganese, and selenium (2 sites – only one date)		

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/20/2001 – 6.0 mg/L	Attaining – Low dissolved oxygen due to low flow conditions and ground water upwelling. Flow was 1.5 cfs. Low nutrients (0.09 nitrogen and 0.07 mg/L phosphorus)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for selenium and dissolved mercury.	

BUNCH RESERVOIR 15020001 -- 0230 65 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 04/17/2001 – 10/17/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Mid lake LCBUN - B 102537	AGFD Ambient	3 total metals only: Copper, manganese, and zinc	3 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, nitrate/nitrite, dissolved oxygen, pH	3 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	07/25/2001 – 6.1 mg/L 10/17/2001 – 5.6 mg/L	Inconclusive – 2 exceedances in 3 samples (Requires a minimum of 5 exceedances and 20 samples to assess as impaired.)

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Missing dissolved metals (copper, cadmium, and zinc), mercury, <i>E. coli</i> bacteria, boron, manganese, and lead to assess designated uses.		
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional dissolved oxygen samples due to the exceedances. Collect sufficient core parameters to represent at least 3 seasons. Low dissolved oxygen may indicate excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.	

CARNERO LAKE 15020001 -- 0260 65 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining AgL – Inconclusive	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIODS: 04/25/2001-10/16/2001; 08/17/2004 – 05/25/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Deepest part of lake LCCAR - A 101839	ADEQ Ambient	3 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	5-6 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 Fluoride 5 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	07/24/2001 – 3.8 mg/L	Inconclusive – Low dissolved oxygen in 1 of 5 sampling events.
pH	<9.0 SU A&Wc, FBC, AgL	07/24/2001 – 9.9 SU 10/16/2001 – 9.7 SU	Inconclusive – High pH in 2 of 6 sampling events.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and pH	Insufficient <i>E. coli</i> bacteria and dissolved metals (cadmium, copper and zinc) to assess A&W and FBC.		The lab detection limits for dissolved metals (cadmium, copper, lead) and total selenium were higher than the chronic A&W criteria for at least 1 sample.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional dissolved oxygen and pH due to exceedances. Low dissolved oxygen and high pH may be symptoms of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals and selenium.	

CHEVELON CANYON CREEK From Black Canyon Creek to Little Colorado River 15020010 -- 001 19.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 12/19/2000 – 07/30/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals 4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese, and selenium	Nutrients – Related 4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	Other 4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity
Below diversion dam near Winslow, AZ LCCHC000.91 100341	ADEQ Ambient			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab detection limits for selenium and dissolved mercury.	

CHOLLA LAKE 15020008 -- 0320 130 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3	
		Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 06/18/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Mid Lake LCCHO - B 102541	AGFD Ambient	2 total metals only: Arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, and zinc	2 sample: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, pH	2 Fluoride 2 Total dissolved solids
Warmwater inlet LCCHO – IN 102540	AGFD Ambient			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient dissolved metals (copper, cadmium, and zinc) and <i>E. coli</i> bacteria, and mercury to assess A&Ww, FBC, and FC	Insufficient sampling events	Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals and selenium	

COLTER CREEK From headwaters to Nutrioso Creek 15020001-293 8.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining AgI -- Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/19/2000 – 08/30/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Rogers Reservoir LCCOL005.53 102020	ADEQ TMDL (turbidity only)	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc	3-4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 1 Suspended sediment concentration 6 Turbidity
Near Nutrioso, AZ LCCOL003.03 100935	ADEQ Ambient	4 total metals only: Boron and manganese		

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters.		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for dissolved metals.	

EAST CLEAR CREEK From headwaters to Yeager Creek 15020008 -- 009 38.0 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 12/20/2000 – 07/31/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Yeager Canyon LCECL017.75 100537	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese, and selenium	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/26/2001 – 5.4 mg/L 07/31/2001 – 6.1 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling. (Flow 0.7 and 0.8 cfs and low nutrients concentrations.)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab detection limits for selenium and dissolved mercury.	

EAST FORK LITTLE COLORADO CREEK From headwaters to Hall Creek 15020001-230 10.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/08/2000 – 09/12/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Montlure Church Camp near Greer LCELR000.99 100948	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron. Manganese, and selenium	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab detection limits for selenium and dissolved mercury.	

FISH CREEK From headwaters to Little Colorado River 15020001 -- 211 9.0 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3	
		Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/18/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Forest Road #118 LCFIS003.86 101244	ADEQ Ambient	1 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 1 total metals only: Boron, manganese	1 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solids 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury (dissolved)	0.01 µg/L – A&Wc 0.6 µg/L – FC	06/18/2001 – 0.8 µg/L	Inconclusive – Only sample collected exceeded both criteria during the assessment period.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Insufficient core parameters	Insufficient sampling events.	Lab detection limit for selenium was higher than A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional mercury samples due to the exceedance. Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for selenium.	

FOOLS HOLLOW LAKE 15020005-0530 150 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 08/08/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCFOO - A 100023	ADEQ Ambient	1 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 1 total metals only: Boron, manganese, and selenium	1 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solids 1 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/08/2003 – 6.5- 6.7	Inconclusive – Low dissolved oxygen on only 1 sampling date. (Binomial)
Selenium	2.0 µg/L A&Wc chronic	08/08/2003 – 10 µg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and selenium	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for selenium and dissolved mercury were higher than the A&Wc chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional dissolved oxygen and selenium due to exceedances. Collect sufficient core parameters to represent at least 3 seasons. Use a lower lab detection limit for selenium and dissolved mercury.	

HALL CREEK From headwaters to Little Colorado River 15020001 -- 012 14.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3	
		Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/20/2000 – 06/19/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Highway 273 LCHAL008.83 101263	ADEQ Ambient	1 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc	1 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solids 5 Turbidity
Highway 373 bridge LCHAL000.85 102274	ADEQ TMDL	1 total metals only: Boron, manganese, and selenium		

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/19/2001 – 6.5 mg/L	Attaining – Low dissolved oxygen due to low flow conditions and ground water upwelling. Flow was 0.1 cfs.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for selenium and dissolved mercury were higher than the A&Wc chronic criterion.
MONITORING RECOMMENDATIONS		Low Priority – Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for selenium and dissolved mercury.	

KINNIKINICK LAKE 15020015 -- 0730 115 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Attaining FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/16/2000 – 04/13/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCKIN - A 100971	ADEQ Ambient	6-9 total and 0-1 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc	6-10 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 8 Fluoride 10 Total dissolved solids 8 Turbidity
Mid Lake LCKIN – B 100972	ADEQ Ambient			
Boat Ramp LCKIN – BR 101325	ADEQ Ambient (bacteria only)	9 total and 4 dissolved: Mercury		

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	09/09/2004 – 6.3 mg/L	Attaining– Low dissolved oxygen in 1 of 10 sampling events (1 of 12 samples).
Lead (dissolved)	1.1 µg/L at 47 mg/L hardness A&Wc chronic	06/14/2001 – 2 µg/L	Inconclusive. Only marginally over the criterion. Only 1 sample analyzed for dissolved lead.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead	Insufficient dissolved metals (cadmium, copper and zinc) to assess A&Wc.		The lab detection limits (for at least 1 sample) for dissolved cadmium, copper, mercury, and silver were higher than the chronic A&W criteria.
MONITORING RECOMMENDATIONS		Low Priority – Collect additional lead samples due to the exceedance. Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals. Note that the old turbidity criterion (10 NTU) was exceeded in all 8 sampling events where turbidity was analyzed. Low dissolved oxygen and turbidity may indicate excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.	

LAKE MARY (LOWER) 15020015 -- 0890 765 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive		
	E P A	FC – Impaired	Category 5 Impaired	Mercury in fish tissue	EPA listed mercury in 2002. Regional mercury TMDL to be completed in 2009.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006/2008 impaired waters list. Such listings do not satisfy requirements established in ADEQ's Impaired Water Identification Rule; therefore, they are not included in the list of ADEQ's Impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 05/02/2002 – 04/12/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCMAL - A 102253	ADEQ TMDL	6 total and 6 dissolved metals: Mercury	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	5 Fluoride 6 Total dissolved solids 1 Turbidity
Mid Lake LCMAL – B 103360	ADEQ TMDL	2 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc		

EXCEEDANCES

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	05/14/2003 – 5.2	Inconclusive – Low dissolved oxygen in 1 of 6 sampling events (binomial).
pH	<9.0 SU A&Wc, FBC, AgL	09/08/2004 – 9.4 SU 08/13/2003 – 10.2 SU	Inconclusive – 2 exceedances in 6 sampling events (7 samples). A minimum of 5 exceedances and 20 samples for impairment decision (binomial).

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and pH	Insufficient dissolved metals (cadmium, copper and zinc), <i>E. coli</i> bacteria, copper and lead to assess A&Wc, FBC, and AgL.		The lab detection limits for dissolved metals (cadmium, copper and lead) were higher than the chronic A&W criteria for at least 1 sample.
DISCUSSION OF MERCURY IMPAIRMENT		Evidence of potential mercury impairment: 1. Mercury fish consumption advisory issued in 2002 remains in effect; and 2. A TMDL should be completed and approved in 2009.	
MONITORING RECOMMENDATIONS		High Priority – Collect mercury samples to support completion of the mercury TMDL. Collect additional dissolved oxygen and pH samples due to the exceedances. Low dissolved oxygen and high pH may indicate an excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals.	

LAKE MARY (UPPER)	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining DWS – Inconclusive AgL – Attaining	Category 2 Attaining Some uses		
	E P A	FC – Impaired	Category 5 Impaired	Mercury in fish tissue	EPA listed mercury in 2002. Regional mercury TMDL to be completed in 2009.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006/2008 impaired waters list. Such listings do not satisfy requirements established in ADEQ's Impaired Water Identification Rule; therefore, they are not included in the list of ADEQ's Impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 05/02/2002 – 04/12/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCMAU - A 100029	ADEQ TMDL	17 total and 17 dissolved: Mercury 9 total and 3-9 dissolved metals: Antimony, arsenic, barium, beryllium, boron, chromium, lead, manganese, nickel, selenium, thallium, and zinc 9 total and 0-2 dissolved: Cadmium, copper, and silver	9-17 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 12 Fluoride 17 Total dissolved solids 11 Turbidity
Mid lake LCMAU – B 101342	ADEQ TMDL			
Near dam LCMAU – A1 101312	ADEQ TMDL			
Near dam also LCMAU – A2 101314	ADEQ TMDL			
Between Newman and Railroad canyons LCMAU – C 102252	ADEQ TMDL			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	6.5 µg/L at 46 mg/L hardness A&Wc acute	05/02/2002 – 10 µg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring. (See note below concerning lab detection limits)
Dissolved oxygen	7.0 mg/L A&Wc	08/13/2003 – 5.9 mg/L 09/08/2004 – 6.1 mg/L	Inconclusive – Low dissolved oxygen in 2 of 6 sampling events.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	09/08/2004 – 0.0185 µg/L	Inconclusive – Only 1 exceedance during the assessment period.
Nickel (dissolved)	18.8 µg/L at 30 mg/L hardness A&Wc chronic	03/24/2004 – 20 µg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.
Nickel	140 µg/L DWS	03/24/2004 – 790 µg/L	Inconclusive – Only 1 exceedance in 3 sampling events.
Zinc (dissolved)	50.5 µg/L at 37 mg/L hardness	08/13/2003 – 80 µg/L	Inconclusive – Only 1 exceedance during the last 3 years of monitoring.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Copper, dissolved oxygen, nickel, zinc	Insufficient dissolved metals (cadmium, copper, and zinc), and <i>E. coli</i> bacteria to assess A&Wc and FBC.		The lab detection limits (for at least 1 sample) for dissolved metals (cadmium, copper, lead, mercury, and silver) were higher than the chronic A&W criteria.
DISCUSSION OF MERCURY IMPAIRMENT		Evidence of potential mercury impairment: <ol style="list-style-type: none"> 1. Mercury fish consumption advisory issued in 2002 remains in effect; and 2. A TMDL should be completed and approved in 2009. 	
MONITORING RECOMMENDATIONS		High Priority – Collect mercury samples to support completion of the mercury TMDL. Collect additional copper, dissolved oxygen, nickel and zinc samples due to the exceedances. Low dissolved oxygen may indicate excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals.	

LEE VALLEY CREEK From headwaters to Lee Valley Reservoir 15020001-232A 1.6 Miles Unique Water	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/19/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Lee Valley Reservoir LCLVL001.32 101243	ADEQ Ambient	1 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, chromium, mercury, nickel, selenium, silver, thallium, and zinc 1 total metals only: Cadmium, copper, lead, and silver	1 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solids 1 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for selenium and dissolved mercury.	

LEE VALLEY RESERVOIR 15020001-0770 35 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining Agl – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/14/2001 – 06/12/2002		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCLEE - A 101356	ADEQ Ambient	3 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, chromium, mercury, nickel, selenium, silver, thallium, and zinc	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 Fluoride 3 Total dissolved solids 3 Turbidity
Shoreline LCLEE – SH 101357	ADEQ Ambient (<i>E. coli</i> only)	3 total metals only: Cadmium, copper, lead, and silver		

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Nitrogen	1.10 mg/L A&Wc and FBC	04/02/2002 – 1.58 mg/L 06/12/2002 – 1.85 mg/L	Inconclusive – Exceeded criteria in 2 of 3 samples. (Requires a minimum of 5 exceedances and 20 samples to assess as impaired.)

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Nitrogen	Insufficient dissolved metals (cadmium, copper) and <i>E. coli</i> bacteria to assess A&W and FBC.		Lab detection limits for dissolved metals (cadmium, copper, mercury, and silver) were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional nitrogen samples due to the exceedances. Elevated nitrogen may indicate excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for dissolved metals.	

LITTLE COLORADO RIVER From West Fork Little Colorado River to Water Canyon 15020001 -- 011 19.8 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 4A Not attaining	Suspended sediment (turbidity)	A turbidity TMDL was approved in 2002. Implementing strategies to reduce sediment loading. (See discussion in reach 15020001-009)

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/20/2000 – 09/12/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
County Road 4036 (X Diamond Ranch) LCLCR352.03 102279	ADEQ TMDL	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total and 0-2 dissolved: Boron, manganese, and selenium	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen 19 Dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 37 Turbidity
County Road pull out LCLCR350.73 102283	Volunteers 319 Project and ADEQ TMDL			
Below South Fork LCR LCLCR350.32 100581	ADEQ Ambient			
Highway 273 bridge LCLCR346.01 102281	ADEQ TMDL			
Schoolhouse Road LCLCR344.58 102284	ADEQ TMDL			
At Water Canyon bridge LCLCR343.72 102282	ADEQ TMDL			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	6/27/2001 – 6.5 mg/L	Attaining – Only 1 exceedance in 19 samples (binomial).

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority – Continue effectiveness monitoring for TMDL implementation strategies. 13 of 37 turbidity samples exceeded the old criteria (10 NTU). Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

LITTLE COLORADO RIVER From Water Canyon to Nutrioso Creek 15020001 -- 010 3.8 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 4A Not attaining	Suspended sediment (turbidity)	A turbidity TMDL was approved in 2002. Implementing strategies to reduce loading. (See discussion in reach 15020001-009)

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/21/2000 – 12/02/2002		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Springerville – 4 th Street LCLCR343.58 102286	ADEQ TMDL	None	30 Dissolved oxygen, 30 pH	30 Turbidity
Springerville – River Street LCLCR343.18 102292	ADEQ TMDL			
Airport road weir LCLCR341.63 102285	ADEQ TMDL			
Above Highway 60 bridge LCLCR340.65 100333	Volunteers 319 Project ADEQ TMDL			
Diversion near Springerville LCLCR339.28 102291	ADEQ TMDL			
At golf course LCLCR302.98 103274	Volunteers 319 Project			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	10/16/2001 – 6.4 mg/L	Attaining – Only 1 exceedance in 30 samples

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Missing core parameters		
MONITORING RECOMMENDATIONS		Medium Priority – Continue effectiveness monitoring for TMDL implementation strategies. Note that 14 of 30 turbidity samples exceeded the old criteria (10 NTU). Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	

LITTLE COLORADO RIVER From Nutrioso Creek to Carnero Creek 15020001-- 009 12.1 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Suspended sediment (turbidity)	A turbidity TMDL was approved in 2002. Implementing strategies to reduce loading. See discussion below.

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/29/2000 – 06/09/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Springerville WWT LCLCR340.02 100331	ADEQ and USGS Ambient	7-24 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 24 total and 0-1 dissolved: Boron, manganese	23-24 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	21 <i>E. coli</i> bacteria 22 Fluoride 21 Total dissolved solids 12 Suspended sediment concentration 42 Turbidity
Casa Malpais across from Becker Lake LCLCR339.28 102287	ADEQ TMDL			
At Weinema Bridge LCLCR336.76 102567	AGFD Ambient			
At Weinema Wildlife area on Hooper Road LCLCR336.72 102290	ADEQ TMDL			
Canyon off Highway 180 LCLCR334.96 102324	ADEQ TMDL			
Road crossing on H-180 LCLCR331.83 102288	ADEQ TMDL			
At Carnero Creek LCLCR328.04 102289	ADEQ TMDL			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
<i>E. coli</i> bacteria	235 CFU/100 ml FBC	08/15/2000 – 260 CFU/100 ml	Attaining – No exceedances in the last 3 years of monitoring. (Note, only marginally over criteria and not above the screening value.)
pH	<9.0 SU A&Wc, FBC, Agl, AgL	06/10/2003 – 9.4 SU	Attaining – Only 1 exceedance in 24 sampling events. (Binomial)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Wc	04/02/2003 – 111 mg/L [#]	Attaining – [#] This exceedance could not be included in the geometric mean calculation because it occurred during a high flow event. Geometric mean was not exceeded. However, the old turbidity standard (10 NTU) was exceeded in 35 of the 42 measurements taken.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limit for selenium was higher than A&Wc chronic criteria.
DISCUSSION OF TURBIDITY IMPAIRMENT		<p>Critical conditions of flow were defined in the TMDL. To date, there is insufficient data collected during the critical elevated flow conditions to determine whether the stream is meeting standards.</p> <p>This reach was originally listed as impaired by turbidity; however, the turbidity standard was replaced by a suspended sediment concentration (SSC) criterion in 2002. As noted above, the SSC standard has not been exceeded in this reach; however, the old turbidity criterion of 10 NTU was exceeded in 35 of 42 field samples.</p> <p>Several proposals in the 2006 Triennial Review of surface water quality standards would also be useful in studying impacts due to sediment and determining impairment, such as:</p> <ul style="list-style-type: none"> A. Biocriteria implementation procedures, B. Narrative bottom deposits implementation procedures, C. Revision of the SSC criterion. <p>Once adopted, these procedures may be applied to this reach.</p>	
MONITORING RECOMMENDATIONS		<p>Medium Priority –Continue effectiveness monitoring for TMDL implementation strategies. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.</p> <p>Use lower lab detection limits for selenium.</p>	

LITTLE COLORADO RIVER From unnamed reach (15020001-021) to Lyman Lake 15020001-- 005 3.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Inconclusive FC – Attaining Agl – Attaining AgL – Attaining	Category 4A Not attaining	Suspended sediment	TMDL approved in 2002 for two reaches upstream. Placed on Category 4 in 2004 due to exceedances. (See discussion in reach 15020001-009)

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/14/2000 – 08/07/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Lyman Lake USGS #09384000 LCLCR323.60 101174	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese, and selenium	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 3 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
<i>E. coli</i> bacteria	235 CFU/100 ml	08/07/2001 – 354 CFU/100 ml	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
<i>E. coli</i> bacteria	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority – Continue effectiveness monitoring for TMDL implementation strategies. Collect suspended sediment concentration samples. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted Note that the old turbidity criterion (10 NTU) was exceeded in 3 of 4 samples (18, 24, and 481 NTU). Collect additional <i>E. coli</i> bacteria due to the exceedance. Use lower lab detection limits for selenium and dissolved mercury.	

LITTLE COLORADO RIVER From Silver Creek to Carr Wash 15020002- 004 6.1 Miles	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Impaired FBC – Impaired FC – Inconclusive DWS – Inconclusive AgI – Attaining AgL – Attaining	Category 5 Impaired	<i>E. coli</i> bacteria, suspended sediment concentration	Added <i>E. coli</i> bacteria in 2004. Adding suspended sediment concentration for 2006.
	E P A	FBC – Impaired	Category 5 Impaired	Suspended sediment	EPA listed sediment in 2004

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006/2008 impaired waters list. Such listings do not satisfy requirements established in ADEQ's Impaired Water Identification Rule; therefore, they are not included in the list of ADEQ's Impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/27/2000 – 06/07/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Woodruff, AZ USGS #09394500 LCLCR226.31 100334	ADEQ and USGS Ambient	14-18 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, zinc 6-8 total and dissolved metals: Barium, nickel, silver, thallium 18 total metals only: Boron, manganese, and selenium	17-18 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	16 <i>E. coli</i> bacteria 18 Fluoride 13 Total dissolved solids 9 Suspended sediment concentration 16 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 µg/L DWS and FBC	08/14/2000 – 67 µg/L	Attaining – Only 1 exceedance in 18 samples. (Binomial)
Barium	2000 µg/L DWS	08/14/2000 – 7700 µg/L# 08/06/2001 – 3400 µg/L#	Inconclusive – 2 exceedances in 8 samples. (Binomial) #Exceedances occurred during monsoon flood events.
Beryllium	4 µg/L DWS	08/14/2000 – 43 µg/L# 08/06/2001 – 13 µg/L#	Inconclusive – 2 exceedances in 8 samples. (Binomial) #Exceedances occurred during monsoon flood events.
Chromium	100 µg/L DWS and FBC	08/14/2000 – 120 µg/L	Attaining – Only 1 exceedance in 17 samples. (Binomial)
Dissolved oxygen	7.0 mg/L A&Wc	08/06/2001 – 6.3 mg/L 08/07/2003 – 6.3 mg/L 08/12/2003 – 6.0 mg/L	Attaining – Only 3 of 17 samples did not meet standards. (Binomial)
<i>E. coli</i> bacteria	235 CFU/100 ml	08/14/2000 – 57000 CFU/100 ml 08/06/2001 – 1800 CFU/100 ml 08/07/2003 – 833 CFU/100 ml	Remains impaired – Only 1 of 7 samples exceeded the criterion in the last 3 years of monitoring (3 in the assessment period).
Lead	15 µg/L – FBC and DWS 100 µg/L – AgL	08/14/2000 – 290 µg/L 05/21/2001 – 19 µg/L 08/06/2001 – 110 µg/L 08/12/2003 – 16 µg/L	Inconclusive – 4 of 18 samples exceeded the 15 µg/L criterion. (Binomial requires a minimum of 5 exceedances and 20 samples.)
Manganese	980 µg/L DWS	08/14/2000 – 9800 µg/L 08/06/2001 – 3300 µg/L	Attaining – Only 2 of 18 samples exceeded criterion. (Binomial)
Mercury	0.6 µg/L FC	05/21/2001 – 0.61	Attaining – Only 1 exceedance in 18 samples. (Binomial) (Only slightly above the criterion)
Nickel	140 µg/L DWS	08/14/2000 – 210 µg/L	Inconclusive – Only 1 exceedance in 8 samples (Binomial)
Suspended sediment	Geometric mean 80 mg/L	10/01/2002 – 98 mg/L 04/01/2003 – 107 mg/L	Impaired – 5 of 9 samples exceeded criterion. No elevated flows (0.2 to 18 cfs). Geometric mean of 4

concentration (SSC)		08/07/2003 – 563 mg/L 09/24/2003 – 101 mg/L 07/07/2004 – 119 mg/L	samples exceeded 80 mg/L five times. Note that the old turbidity standard (10 NTU) was also exceeded in all 16 samples.
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Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Barium, beryllium, lead, nickel	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
DISCUSSION OF IMPAIRMENT DUE TO SUSPENDED SEDIMENT CONCENTRATION		EPA originally listed sediment in 2004. In the current assessment, ADEQ has sufficient evidence to also list this reach as impaired by suspended sediment based on 5 exceedances of geometric mean standard.	
MONITORING RECOMMENDATIONS		<p>High Priority – Collect additional <i>E. coli</i> and sediment samples to support TMDL development. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.</p> <p>Collect additional barium, beryllium, lead and nickel samples due to the exceedances.</p> <p>Use lower lab detection limits for selenium and dissolved mercury.</p>	

LITTLE COLORADO RIVER From Porter Tank Draw to McDonalds Wash 15020008 -- 017 17.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive DWS – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 5 Impaired	Copper, silver and suspended sediment	Copper and silver on 303(d) List since 1992. Added suspended sediment in 2004.

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/20/2000 – 09/23/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Joseph City, AZ USGS #09397300 LCLCR206.75 101480	USGS Ambient	None	None	30 Suspended sediment (7-day averages)

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Wc	Too many to list out here.	Remains impaired –Exceeded during all 30 of 7-day aggregation periods. Concentrations ranged from 107-130,000 mg/L and the average concentration was 57,835 mg/L. Some measurements occurred during elevated flows, and would be excluded from the geometric mean calculation, but not all values.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Missing all core parameters needed to assess designated uses.		
MONITORING RECOMMENDATIONS		High Priority – Collect additional sediment, copper, and silver samples to support TMDL development. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted Collect core parameters to represent at least 3 seasons during the assessment period.	

LONG LAKE (LOWER) 15020008 -- 0820 320 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3 Inconclusive		
	E P A	FC – Impaired	Category 5 Impaired	Mercury in fish tissue	EPA listed mercury in 2004 due to mercury fish consumption advisory. Regional mercury TMDL to be completed in 2009.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006/2008 impaired waters list. Such listings do not satisfy requirements established in ADEQ's Impaired Water Identification Rule; therefore, they are not included in the list of ADEQ's Impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/17/2000 – 07/13/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam LCLLL - A 101715	ADEQ Ambient	8 total and 7 dissolved: Mercury	3-6 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 5 Fluoride 6 Total dissolved solids 1 Turbidity
Shoreline LCLLL - SHORE 100999	ADEQ Ambient (algae only)	3-4 total and dissolved: Cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc		
North Cove LCLLL – NC 102760	AGFD Ambient	4 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron, manganese, selenium, silver, thallium		
South Cove LCLLL – SC 102555	AGFD Ambient			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
pH	<9.0 SU A&Wc FBC, Agl, AgL	08/07/2003 – 9.8 SU 07/03/2003 – 9.5 SU	Inconclusive – 2 of 8 samples exceeded the criterion. (Binomial method requires a minimum of 5 exceedances and 20 samples to assess as impaired.)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
pH	Missing <i>E. coli</i> bacteria to assess FBC.		Lab detection limits for dissolved metals (copper, lead, mercury, selenium, and silver) and total selenium were higher than applicable criteria for at least 1 sample.
DISCUSSION OF MERCURY IMPAIRMENT		Evidence of potential mercury impairment: 1. Mercury fish consumption advisory issued in 2003 remains in effect; and	

	2. A regional mercury TMDL should be completed in 2007.
MONITORING RECOMMENDATIONS	<p>High Priority –Collect mercury samples to support TMDL development. Collect additional pH measurements due to the exceedance. Collect sufficient <i>E. coli</i> bacteria to represent at least 3 seasons. Use lower lab detection limits for dissolved metals and selenium.</p> <p>Elevated pH may indicate excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.</p>

LYMAN LAKE 15020001-0850 1310 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining Agl – Attaining AgL – Attaining	Category 2 Attaining some uses		
	E P A	FC – Impaired	Category 5 Impaired	Mercury in fish tissue	EPA listed mercury in 2004 due to mercury fish consumption advisory.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006/2008 impaired waters list. Such listings do not satisfy requirements established in ADEQ's Impaired Water Identification Rule; therefore, they are not included in the list of ADEQ's Impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 04/20/2004 – 11/03/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCLYM - A 101841	ADEQ Ambient	8 total and 2 dissolved: Mercury 5-6 total and dissolved metals: Cadmium, chromium, copper, lead, nickel, silver, and zinc	6 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH	6 Fluoride 6 Total dissolved solids
Mid Lake LCLYM – B 101842	ADEQ Ambient	6 total metals only: Antimony, arsenic, barium, beryllium, manganese, mercury, selenium, and thallium (3-4 samples per site)	4 samples: Dissolved oxygen	

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/17/2004 – 6.5	Inconclusive – On this one date, there was insufficient dissolved oxygen <u>at one meter</u> but adequate levels at 0.5 and 0.1 meters.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen.	Insufficient <i>E. coli</i> bacteria to assess FBC.		
DISCUSSION OF MERCURY IMPAIRMENT		Evidence of potential mercury impairment: Mercury fish consumption advisory issued in 2004 remains in effect.	
MONITORING RECOMMENDATIONS		High Priority – Collect mercury data to support TMDL development. Collect dissolved oxygen samples due to the exceedance. The old turbidity standard (10 NTU) was exceeded in all 3 sampling events (87, 97, and 155 NTU). Low dissolved oxygen and high turbidity may be symptoms of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect missing core parameters to represent at least 3 seasons.	

MINERAL CREEK From headwaters to Concho Creek 15020002-648 25.8 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/15/2000 – 08/07/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Forest Road #404 LCMIN018.05 100593	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese, and selenium	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 0 Suspended sediment concentration 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	05/01/2001 – 6.4 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling. Low nutrient concentrations (0.26 mg/L nitrogen, 0.09 mg/L phosphorus).

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab detection limits for selenium and dissolved mercury.	

NELSON RESERVOIR 15020001 -- 1000 65 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl -- Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 04/20/2004 – 8/18/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCNEL - A 101840	ADEQ Ambient	2 total and 1-2 dissolved metals: Cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc 2 total metals only: Antimony, arsenic, barium, beryllium, manganese, selenium, and thallium	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH 4 samples: Dissolved oxygen	0 <i>E. coli</i> bacteria 6 Fluoride 6 Total dissolved solids 0 Suspended sediment concentration 0 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/17/2004 – 6.2	Inconclusive – There was insufficient dissolved oxygen <u>at one meter</u> but adequate concentrations at 0.5 and 0.1 meters. Insufficient sampling events.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient samples to assess any designated uses	Insufficient sampling events	
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional dissolved oxygen samples due to the low dissolved oxygen. Low dissolved oxygen may be a symptom of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring due to the one low dissolved oxygen. Collect missing core parameters to represent at least 3 seasons during the assessment period.	

NEWMAN CANYON From headwaters to Upper Lake Mary 15020015 -- 206 9.1 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3	
		Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 9/10/2003 – 04/07/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Upper Lake Mary inlet LCNWC000.10 102369	ADEQ TMDL	4 total and 4 dissolved: Mercury 2 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc.	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen. 4: dissolved oxygen, pH	4 Fluoride 3 Total dissolved solids 3 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury (dissolved)	0.01 µg/L A&Wc chronic	09/10/2003 – 0.016 µg/L	Inconclusive -- Only 1 exceedance during the assessment period

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Insufficient core parameters	Insufficient sampling events	Lab detection limits for dissolved cadmium, copper, lead, and silver were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority –Collect mercury samples due to the exceedance. Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for dissolved metals. Note that the old turbidity criterion (10 NTU) was exceeded in all 3 samples collected. Collect suspended sediment concentration data. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	

NUTRIOSO CREEK From headwaters to Nelson Reservoir 15020001-017A 13.3 Miles (New reach split at Nelson Reservoir)	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining all uses		Delist turbidity / suspended sediment. See discussion below.

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/14/2000 – 11/02/2005 (Ambient monitoring 11/08/2000 – 08/30/2001)		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At weir LCNUT026.83 102008	ADEQ TMDL	4 total and 4 dissolved: Mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen 12 Dissolved oxygen 12 pH	4 <i>E. coli</i> bacteria 4 Fluoride 10 Total dissolved solids 26 Suspended sediment concentration 26 Turbidity
Co Rd 2015 Bridge LCNUT023.45 102003	ADEQ TMDL	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, thallium, and zinc		
Hwy 180 Bridge LCNUT023.17 102002	ADEQ TMDL	4 total metals only: Boron, manganese, mercury, and selenium		
At Jenson property LCNUT022.30 102001	ADEQ TMDL			
At cemetery before bridge LCNUT021.75 102000	ADEQ TMDL			
At EC Bar Ranch LCNUT020.85 102112	ADEQ TMDL			
Crosswhite reference site LCNUT020.72 101998	ADEQ TMDL			
Near Nutrioso, AZ LCNUT020.23 100936	ADEQ Ambient			
Near EC Bar Ranch LCNUT019.07 102011	ADEQ TMDL			
At old corral LCNUT017.61 101994	ADEQ TMDL			
Near Private Drive LCNUT016.85 101993	ADEQ TMDL			
Upstream of Nelson Res LCNUT015.61 100344	ADEQ TMDL			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/12/2001 – 5.1 mg/L 08/30/2001 – 6.5 mg/L 06/10/2004 – 4.2 mg/L	Attaining – At least one exceedance was due to natural conditions of low flow and ground water upwelling (flow 0.1 cfs). Only 2 other exceedances in 12 samples (binomial).

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
DELISTING CRITERIA FOR TURBIDITY IMPAIRMENT		<p>Although this reach was originally listed as impaired by turbidity, the turbidity standard was replaced by a suspended sediment concentration (SSC) criterion in 2002. Turbidity / suspended sediment is to be delisted from this reach as the SSC standard has not been exceeded with 26 samples.</p> <p>Watershed improvements projects have also been completed in this reach that should reduce sediment loadings from grazing activities.</p>	
MONITORING RECOMMENDATIONS		<p>Medium Priority –Continue effectiveness monitoring for TMDL implementation strategies. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted</p> <p>Use lower lab detection limits for selenium and dissolved mercury.</p>	

NUTRIOS CREEK From Nelson Reservoir to Picnic Creek 15020001-017B 13.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 4A Not attaining	Suspended sediment (turbidity)	Turbidity TMDL approved in 2000.

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/14/2000 – 11/02/2005 (Ambient monitoring 11/08/2000 – 08/30/2001)		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Nelson Reservoir LCNUT013.33 101722	ADEQ TMDL	1 total and 1 dissolved: Mercury	4 Dissolved oxygen 4 pH	1 <i>E. coli</i> bacteria 4 Suspended sediment concentration 2 Turbidity
Highway 180 milepost 407 LCNUT011.29 101988	ADEQ TMDL			
Near Molina Basin LCNUT009.31 101982	ADEQ TMDL			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No exceedances			

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters		
MONITORING RECOMMENDATIONS		Medium Priority –Continue effectiveness monitoring for TMDL implementation strategies. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Insufficient suspended sediment concentration data in this reach to determine whether standards are currently being met. Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for selenium and dissolved mercury.	

NUTRIOSO CREEK From Picnic Creek to Little Colorado River 15020001 -- 015 3.5 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 4A Not attaining	Suspended sediment (turbidity)	Turbidity TMDL approved in 2000.

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 01/14/2000 – 11/02/2005 (Ambient monitoring 11/08/2000 – 08/30/2001)		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
No current data Older data collected for sites: 102010 and 104318				Remains impaired until suspended sediment concentration or other data indicates standards are being attained.

PORTER CREEK From headwaters to Show Low Creek 15020005 -- 246 4.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/23/2002 – 06/11/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Scott Reservoir LCPRT002.28 101415	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, mercury, and zinc 3-4 total metals only: Boron, lead, manganese, and selenium	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/11/2003 – 4.6 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling. Flow was only 0.01 cfs.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and some of the dissolved copper samples were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium and dissolved copper.	

RAILROAD CANYON From headwaters to Upper Lake Mary 15020015 -- 204 5.4 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3	
		Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/09/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Upper Lake Mary inlet LCRRC000.05 102370	ADEQ TMDL	1 total and dissolved metals: Chromium, mercury, nickel, and zinc 1 total metals only: Antimony, arsenic, barium, beryllium, boron cadmium, copper, lead, manganese, selenium, silver, and thallium.	1 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Fluoride 1 Total dissolved solids 1 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	Lab detection limits for dissolved metals (cadmium, copper, lead and silver) were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for dissolved metals.	

RAINBOW LAKE 15020005 -- 1170 110 Acres	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Wc – Impaired FBC – Impaired FC – Attaining Agl – Impaired AgL – Impaired	Category 4A Not attaining	Narrative nutrients, low DO, and pH	A narrative nutrient TMDL was approved in 2000 due to low dissolved, high pH, excess weeds, and occasional fish kills. Implementing strategies to reduce nutrient loading.

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATES: 06/13/2002; 08/19/2004; 05/24/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCRAI - A 100069	ADEQ Ambient	4 total and dissolved metals: Cadmium, chromium, copper, lead, nickel, selenium, and zinc	4-5 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	7 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids
Mid lake LCRAI - B 100070	ADEQ Ambient	4 total and 0-1 dissolved: Antimony, arsenic, barium, beryllium, boron, manganese, mercury, silver, thallium		

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/19/2004 – 6.0 mg/L (both sites)	Remains impaired – Exceedances in 1 of 3 sampling events. (Binomial)
pH (high)	<9.0 SU	08/19/2004 – 9.4 SU 06/13/2004 – 9.24 SU	Remains impaired – Exceeded criterion on 2 of 3 sampling events (4 of 5 samples). (Binomial)

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limit for selenium was higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority –Continue monitoring to determine effectiveness of implementation strategies to reduce loadings. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.	

RIO DE FLAG From Flagstaff WWTP discharge to San Francisco Wash 15020015 – 004B 3.7 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wedw – Attaining PBC – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 12/21/2000 – 07/30/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Doney Park LCRDF002.11 101127	ADEQ Ambient	4-5 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese, and selenium	4 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wedw chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium and dissolved mercury. (Note: A site specific Aquatic and Wildlife copper standard of 36 µg/L applies to this reach.)	

RIVER RESERVOIR 15020001-1220 140 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 04/17/2001 – 10/18/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Mid Lake LCRIV - B 102556	AGFD Ambient	3 total metals: Copper, lead, manganese, and zinc	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH 4 samples: Dissolved oxygen	3 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Missing dissolved metals (cadmium, copper, and zinc), mercury, <i>E. coli</i> bacteria, boron, manganese, and lead to assess designated uses.		
MONITORING RECOMMENDATIONS		Low Priority – Collect missing core parameters to represent at least 3 seasons during the assessment period.	

SHOW LOW CREEK From headwaters to Linden Wash 15020005 – 012 19.5 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/15/2000 – 08/06/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Near Show Low, AZ USGS #09390500 LCSHL021.46 100340	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese, and selenium	4 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 3 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/06/2001 – 5.0 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling. (Flow was 0.5 cfs)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for selenium and dissolved mercury. The old turbidity standard of 10 NTU was exceeded all 3 samples (15.25, and 57). Recommend collecting suspended sediment concentration data. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	

SILVER CREEK From headwaters to Show Low Creek 15020005 – 013 33.6 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining all uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/15/2000 – 08/07/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below AGFD hatchery LCSIL043.84 101125	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese, and selenium	4 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/07/2001 – 6.4 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling. Low nutrients (nitrogen 0.4 and phosphorus 0.096 mg/L)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for selenium and dissolved mercury. The old turbidity standard of 10 NTU was exceeded in 1 of 4 samples (19.4). Recommend collecting suspended sediment concentration data. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	

SILVER CREEK From Sevenmile Draw to Little Colorado River 15020005 – 001 9.3 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3	
		Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 10/22/2002 – 01/28/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
250 Feet below USGS gage Below USGS #09393500 LCSIL013.65 100337	ADEQ Ambient	2 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, and zinc 1-2 total metals only: Boron, lead, manganese, mercury, and selenium	2 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 2 Fluoride 2 Total dissolved solids 1 Suspended sediment concentration 2 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	Lab detection limit for selenium was higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Collect sufficient core parameters to represent at least 3 seasons. Use a lower lab detection limit for selenium. The old turbidity standard of 10 NTU was exceeded in both samples (136 and 23 NTU). Recommend collecting suspended sediment concentration data. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	

SOLDIER'S ANNEX LAKE 15020008 -- 1430 120 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3 Inconclusive		
	E P A	FC – Impaired	Category 5 Impaired	Mercury in fish tissue	EPA listed in 2004 due to mercury in fish tissue.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006/2008 impaired waters list. Such listings do not satisfy requirements established in ADEQ's Impaired Water Identification Rule; therefore, they are not included in the list of ADEQ's Impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 09/18/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Dam LCSAL - A 103354	AGFD Ambient	None	1 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	
DISCUSSION OF MERCURY IMPAIRMENT		Evidence of potential mercury impairment: 1. Mercury fish consumption advisory issued in 2003 remains in effect; and 2. A regional mercury TMDL should be approved in 2007.	
MONITORING RECOMMENDATIONS		High Priority –Collect mercury samples to support TMDL development. Collect core parameters to represent at least 3 seasons during the assessment period.	

SOLDIER'S LAKE 15020008 -- 1440 28 Acres	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Attaining Agl – Attaining	Category 2 Attaining some uses		
	E P A	FC – Impaired	Category 5 Impaired	Mercury in fish tissue	EPA listed in 2004 due to mercury in fish tissue.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006/2008 impaired waters list. Such listings do not satisfy requirements established in ADEQ's Impaired Water Identification Rule; therefore, they are not included in the list of ADEQ's Impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 05/29/2003 – 04/12/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Mid lake LCSOI -A 101733	ADEQ and AGFD Ambient	3-4 total and dissolved metals: Chromium, mercury, nickel, selenium, and zinc 4 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron, cadmium, copper, lead, manganese, selenium, silver, thallium	4-5 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 Fluoride 5 Total dissolved solids 2 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	07/02/2003 – 6.2 mg/L 07/13/2003 – 6.7 mg/L	Inconclusive – Low dissolved oxygen in 2 of 5 sampling events. (Binomial requires a minimum of 5 exceedances and 20 samples to assess as impaired.)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient <i>E. coli</i> bacteria, dissolved copper, and dissolved cadmium to assess FBC and A&Wc		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, selenium, and silver) were higher than applicable criteria for at least 1 sample.
DISCUSSION OF MERCURY IMPAIRMENT		Evidence of potential mercury impairment: 1. Mercury fish consumption advisory issued in 2003 remains in effect; and 2. A regional mercury TMDL should be approved in 2009.	
MONITORING RECOMMENDATIONS		High Priority –Collect mercury samples to support TMDL development. Collect additional dissolved oxygen measurements due to the exceedance. Low dissolved oxygen may be a symptom of excess nutrient loading. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect missing core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals.	

TUNNEL RESERVOIR 15020001-1550 40 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 04/17/2001 – 10/17/2001		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Mid Lake LCTUN - B 102568	AGFD Ambient	3 total metals: Copper, lead, and zinc 2 total metals: Manganese	2-3 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH 4 samples: Dissolved oxygen	3 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/17/2004 – 3.7 mg/L	Inconclusive – Only 1 exceedance out of 2 samples. (Binomial)
Nitrogen	1.1 mg/L A&Wc and FBC	07/25/2001 – 1.1 mg/L	Inconclusive – Only 1 exceedance in 3 samples. (Binomial) Note that nitrogen was also elevated but not exceeding the standard (at 0.91 mg/L) on 10/17/2001.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and nitrogen	Missing dissolved metals, mercury, <i>E. coli</i> bacteria, boron, manganese, and lead to assess designated uses.		
MONITORING RECOMMENDATIONS		Medium Priority – Collect low dissolved oxygen and nitrogen samples due to exceedances. Low dissolved oxygen and high nitrogen may indicate excess nutrient loading to this lake. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect missing core parameters to represent at least 3 seasons during the assessment period.	

WEST FORK LITTLE COLORADO RIVER From headwaters to Government Springs 15020001-013A 9.1 Miles Unique Water	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Attaining FBC – Attaining FC – Inconclusive	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 11/07/2000 – 06/16/2003		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Below Sheep's Crossing LCW/LR004.09 100945	ADEQ Ambient	3-7 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 7 total and 0 dissolved: Boron, manganese, and selenium	6-7 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	7 <i>E. coli</i> bacteria 7 Fluoride 7 Total dissolved solids 3 Suspended sediment concentration 7 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury	0.6 µg/L FC	10/23/2002 – 0.64 µg/L	Inconclusive – Only 1 exceedance in 7 samples. (Binomial)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional mercury data due to the exceedance. Use lower lab detection limits for selenium and dissolved mercury.	

WEST FORK LITTLE COLORADO RIVER From Government Springs to Little Colorado River 15020001-013B 2.2 Miles	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Attaining FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/30/2000 – 06/08/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Government Springs LCWLR000.92 100328	ADEQ Ambient	7-21 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, thallium, and zinc 21 total metals only: Boron, manganese, and selenium 20 total and 12 dissolved: Mercury	20-21 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	21 <i>E. coli</i> bacteria 21 Fluoride 18 Total dissolved solids 12 Suspended sediment concentration 21 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	4.9 µg/L at 29 mg/L hardness 3.2 µg/L at 22 mg/L hardness A&Wc acute	03/20/2002 – 13 µg/L 12/29/2004 – 22 µg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring (2 during the assessment period). However, the total copper analysis on both dates indicated that total copper was <10 mg/L. Because the dissolved copper should not exceed the total copper by more than 10%, these values alone are not reliable enough to determine impairment. No anthropomorphic sources of copper in the watershed.
Dissolved oxygen	7.0 mg/L A&Wc	06/28/2000 – 6.7 mg/L 08/14/2000 – 6.5 mg/L 08/13/2003 – 5.8 mg/L	Attaining – Low dissolved oxygen is due to natural conditions of ground water upwelling.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Copper	Collected all core parameters		Lab detection limits for selenium and dissolved metals (cadmium, copper, lead, mercury, and zinc) were higher than A&Wc chronic criteria in 4-22 samples.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional copper samples due to the exceedances. Use lower lab detection limits for selenium and dissolved metals.	

WILLOW SPRINGS LAKE 15020010-1670 160 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/22/2002 – 07/15/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCWIS - A 100091	AGFD and ADEQ Ambient	1-2 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	3-5 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH, dissolved oxygen	1 <i>E. coli</i> bacteria 2 Fluoride 5 Total dissolved solids 2 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	07/16/2002 – 6.2 mg/L 08/08/2003 – 6.6 mg/L	Inconclusive – Low dissolved oxygen in 2 of 4 sampling events. (Binomial method requires a minimum of 5 exceedances and 20 samples to determine impairment.)
Selenium	2.0 µg/L A&Wc chronic	08/08/2003 – 6.0 µg/L	Inconclusive – Only 1 exceedance in last 3 years of monitoring.

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and selenium	Insufficient core parameters	Insufficient sampling events	Lab detection limits for dissolved metals (cadmium, copper, mercury, and silver) were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		<p>Medium Priority – Collect additional dissolved oxygen and selenium samples due to the exceedances. Low dissolved oxygen may indicate excess nutrients. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.</p> <p>Collect missing core parameters to represent at least 3 seasons during the assessment period.</p> <p>Use lower lab detection limits for dissolved metals.</p>	

WOODS CANYON LAKE 15020010-1700 70 Acres	USE SUPPORT	OVERALL ASSESSMENT	
	A&Wc – Inconclusive FBC – Attaining FC – Attaining DWS – Attaining Agl – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIODS: 10/19/2000 –11/02/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam LCWCL - A 100092	AGFD and ADEQ Ambient	4-6 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	11-16 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH, dissolved oxygen	3 <i>E. coli</i> bacteria 7 Fluoride 16 Total dissolved solids 11 Turbidity
Mid lake LCWCL – B 100093	ADEQ Ambient			
At boat ramp LCWCL – BR 101324	ADEQ Ambient (bacteria only)			

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	07/16/2002 – 6.2 mg/L 10/28/2002 – 6.2 mg/L 07/23/2003 – 6.6 mg/L 10/20/2003 – 5.9 mg/L 08/19/2004 – 5.5 mg/L	Inconclusive – Low dissolved oxygen in 5 of 13 sampling events (5 of 16 samples). (Binomial method requires a minimum of 5 exceedances and 20 samples to list as impaired.)
pH	>6.5 SU A&Wc, FBC, AgL	10/19/2000 – 6.38 SU	Attaining – Only 1 low pH in 13 sampling events (1 of 16 samples) (Binomial).

Pollutant: Assume “total” concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MONITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and pH	Insufficient dissolved copper, cadmium, and zinc needed to assess A&Wc		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, and silver) and total selenium were higher than A&Wc chronic criteria in one or more sample.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional dissolved oxygen due to the exceedances. Low dissolved oxygen may indicate excess nutrient loadings. New methods for implementing the narrative nutrient standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.	
		Collect missing core parameters to represent at least 3 seasons during the assessment period.	
		Use lower lab detection limits for dissolved metals and selenium.	